B. F. SMITH.

Non-Conducting Covering.

No. 225,767. Patented Mar. 23, 1880.

Fig. 6

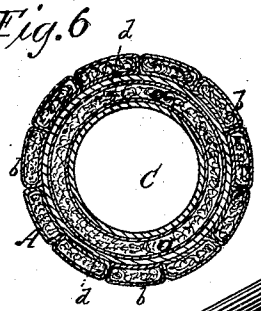


Fig. 1

Fig. 5

Fig. 2

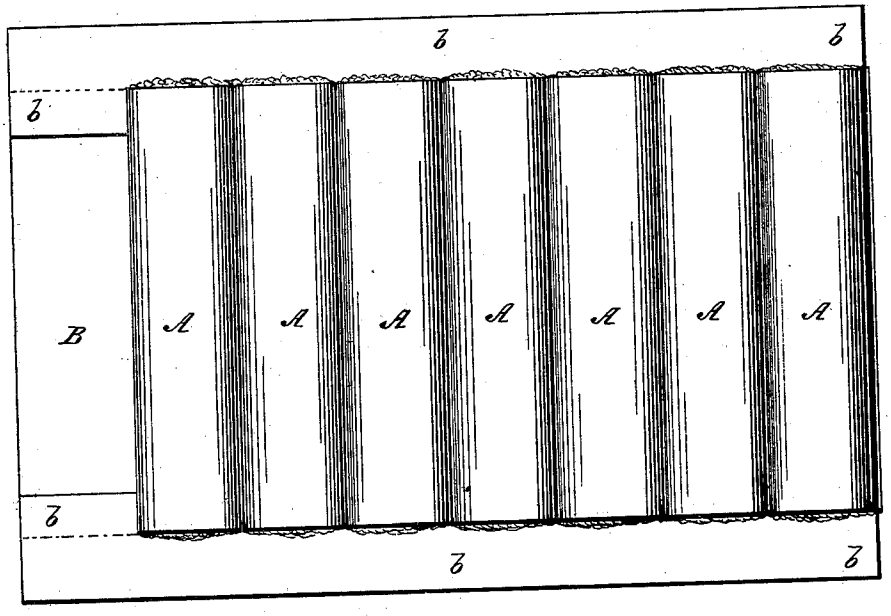


Fig. 3

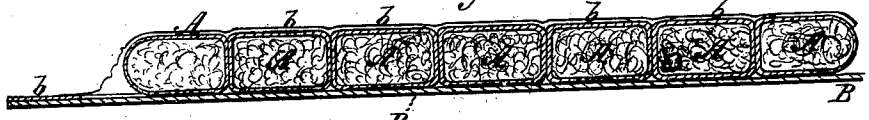


Fig. 4



Witnesses:

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by

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UNITED STATES PATENT OFFICE.

BENJAMIN F. SMITH, OF NEW ORLEANS, LOUISIANA, ASSIGNOR OF ONE-HALF OF HIS RIGHT TO CHARLES J. LEWIS, OF SAME PLACE.

NON-CONDUCTING COVERING.

SPECIFICATION forming part of Letters Patent No. 225,767, dated March 23, 1880.

Application filed February 24, 1880.

To all whom it may concern:

Be it known that I, BENJAMIN F. SMITH, of the city of New Orleans, parish of Orleans, and State of Louisiana, have invented certain new and useful Improvements in Non-Conducting Coverings, of which the following is a specification, the same being an improvement on the non-conducting covering for which a patent was granted me February 21, 1871, No. 111,984.

The object of my invention is the production of a covering for steam-boilers and steam-pipes which, by reason of its qualities as a non-conductor of heat, will afford protection against the loss of steam by condensation due to atmospheric influence, and so result in a great saving of the fuel required for the generation of steam.

This covering, which in ordinary parlance I designate as a "felting" for steam-boilers and steam-pipes, is also applicable wherever it is desirable to afford protection against the action of external or atmospheric heat, as in the case either of domestic refrigerators or of vessels intended for transportation of perishable articles by sea, whether flesh or fruit, or for the preservation of like articles during land transit in railroad-cars, the felting in either of these cases or under other circumstances of analogous use being so applied as to envelop or afford a covering for the articles to be protected against injury from heat.

Heretofore in the use of cotton-seed hulls and rice-seed hulls as contemplated in my said patent, as well as in all other forms of non-conductors which are put over the entire surface to be protected, it is found difficult, if not impossible, to remove the covering for repairs without either greatly injuring or entirely destroying it.

To remedy this evil I make up my covering or felting in sections, and preferably about two feet in width by two or more feet in length, thus enabling any unskilled laborer either to apply them or remove any section of the same and replace it without injury to itself or any other section.

I will now proceed to describe my mode of preparing these sections of my improved felting.

In the drawings, Figure 1, A indicates a tube, made of paper and open at each end. This tube I fill with the hulls of cotton-seed or the hulls of rice-seed, or with a mixture of both, using for such purpose any proper instrument for ramming such hulls into the tube with regularity and compactness. These tubes, in practice, I make about two inches in diameter by two feet in length, and, for convenience, I make them of tubular form, as shown, although they may be made four-sided or square in cross-section, or of any other form which will answer the purpose designed, my object being to construct my improved felting of tubes filled, as above described, thereby securing an evenness and compactness in the body of the felting which can be secured in no other way.

In Fig. 2, B indicates a strip of cotton cloth, (that known as "drilling" preferred,) which in width is equal to the length of the tubes A, shown in said figure. To the side edges of this cloth I paste strips of tough pliable paper, as shown at *b*. These strips are made of such width that when the tubes are laid upon the cloth B, as shown in Fig. 2, they may be lapped up over the ends of the tubes, as shown in Fig. 4, and in such position secured by glue or paste, and thus keep the hulls of the cotton or rice seed within the tubes. Having filled a sufficient number of tubes with which to construct a given section of my felting, these tubes are then glued or pasted upon a cloth, as at B, provided with side lapping, *b*, of paper, as represented in Fig. 2. These tubes are secured side by side, as indicated in the figure, and in the act of gluing them thereon are pressed against each other, so as to snugly abut and in such position be retained when the glue or paste becomes dry. Having thus glued the several tubes A to the cloth or backing B, that portion of the paper strips *b* which extends beyond the ends of the tubes is then turned over these ends and pasted down upon the tubes, as seen in Fig. 4. The pressing of the tubes together in the act of securing them upon the cloth B will cause each of the tubes to assume an upwardly-bulging form; but when the glue becomes dry and pressure is applied upon the section these tubes will

then be made to assume the shape and compact abutment against each other shown in section in Fig. 3, or this compact condition of the tubes may be effected simply by binding the sections around a steam-pipe to be protected.

The cloth B serves as a backing to the section of felting and for holding the tubes in position, and in making up a section a portion of this backing at one end is not covered by a tube, and serves as a means of handling the section and of properly securing its two ends together when wound around a steam-pipe. This backing B also serves as a means for fastening the felting to surfaces to be protected, and in so doing the nails may be passed between adjoining tubes, and thus avoid penetrating them to their injury.

Instead, however, of using cloth for the backing B, I can with advantage use strong paper, and whether the backing be made of paper or cloth, the backing itself may be of such dimensions as will admit of its being turned up over the ends of the tubes.

In applying my felting to a surface the backing B serves as an outer and uniform covering or protection to the several tubes employed in constructing a given section thereof; and it is manifest that where any object or surface requires a large quantity of my felting to protect it any particular portion of it may be removed and a new section supplied without injury to or disturbance of the whole quantity of felting employed to cover such object.

Felting thus made up constitutes a merchantable article for the trade, well adapted for transportation, and ready for use when required.

The felting thus constructed I contemplate, in some instances, to place directly in contact with a steam-pipe or steam-boiler; but under some circumstances, in order to protect the felting from the direct action of the heat of the pipe or boiler, I make annular air-spaces around the pipe or boiler to which the felting is applied, as indicated in Fig. 5. I make tubes or bags of cotton cloth about two inches in diameter and of lengths to go around the pipe or boiler and fill them with cotton-seed hulls. These tubes or bags, as at *a*, I place around the pipe or boiler C, (represented in said figure,) say twelve inches apart, and fasten them in place. I then lay on pasteboard *d* and thereupon apply the felting around the pasteboard with the tubes A of the felting extending in the direction of the length of the pipe or boiler. By such mode of applying the felting the air confined in the annular spaces, as at *e*, around the pipe or boiler is perfectly secured against circulation or escape in a longitudinal direction.

Heretofore air-spaces between steam pipes and boilers and their non-conducting covering have been made to extend the whole length of such pipes or boilers, in which case a defect at either end would permit the escape of the air and its circulation the whole length of the pipe or boiler. But by my mode of applying the felting, just described, I can avail myself of air-spaces (one inch in depth of which with one inch in thickness of felt will be equivalent to two inches in thickness of felt) without liability to such objectionable circulation and escape of air.

Fig. 6 is a transverse section in the line *x x* of Fig. 5.

Having described my invention, what I claim is—

1. Felting which is composed of non-conducting substance inclosed in a series of tubes applied to a backing of cloth or paper or other flexible backing, substantially as and for the purpose described.

2. In combination with the felting A and pipe C, or its equivalent, the partitions *a*, whereby annular air-spaces *e* are formed, substantially as and for the purpose described.

Witness my hand in the matter of my application for a patent for improvement in non-conducting material or felting this 8th day of April, A. D. 1878.

BENJ. F. SMITH.

Witnesses:
W. A. S. WHEELER,
G. A. WILLIAMS.